

4.1 #18

$$y = a \sin bx$$

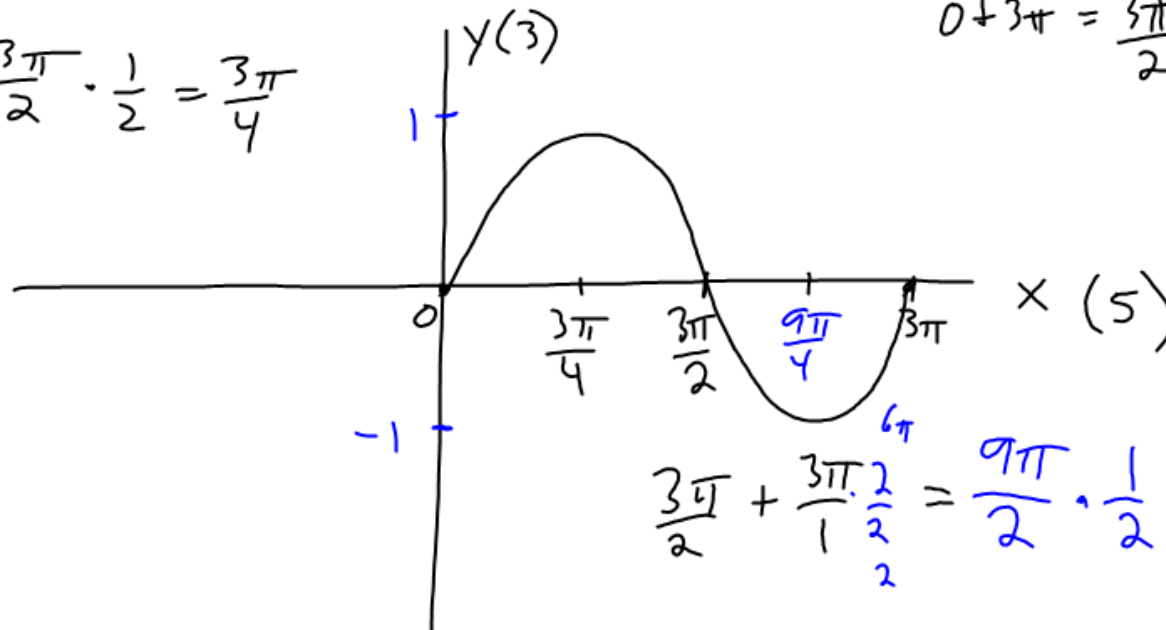
$$y = \sin \frac{2}{3}x$$

$$P = \frac{2\pi}{b}$$

$$P = \frac{2\pi}{\frac{2}{3}} \Rightarrow 2\pi \cdot \frac{3}{2} = \frac{6\pi}{2} = 3\pi$$

$$0 + \frac{3\pi}{2} = \frac{3\pi}{2} \cdot \frac{1}{2} = \frac{3\pi}{4}$$

$$0 + 3\pi = \frac{3\pi}{2} = \frac{3\pi}{2}$$



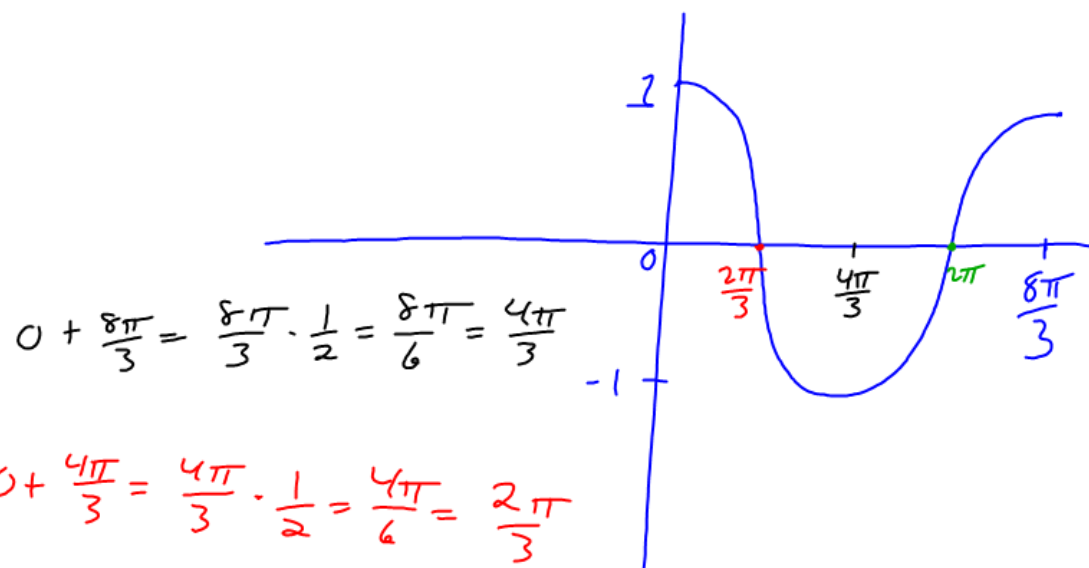
$$\frac{3\pi}{2} + \frac{3\pi}{1} \cdot \frac{2}{2} = \frac{9\pi}{2} \cdot \frac{1}{2} = \frac{9\pi}{4}$$

4.1 #19

$$y = \cos \frac{3}{4}x$$

$$P = \frac{2\pi}{b} = \frac{2\pi}{\frac{3}{4}} \Rightarrow 2\pi \cdot \frac{4}{3} = \frac{8\pi}{3}$$

Try 4.1  
# 23 - 33 (odd)



$$0 + \frac{8\pi}{3} = \frac{8\pi}{3} \cdot \frac{1}{2} = \frac{8\pi}{6} = \frac{4\pi}{3}$$

$$0 + \frac{4\pi}{3} = \frac{4\pi}{3} \cdot \frac{1}{2} = \frac{4\pi}{6} = \frac{2\pi}{3}$$

$$\frac{4\pi}{3} + \frac{8\pi}{3} = \frac{12\pi}{3} = 4\pi \cdot \frac{1}{2} = 2\pi$$

# Graph

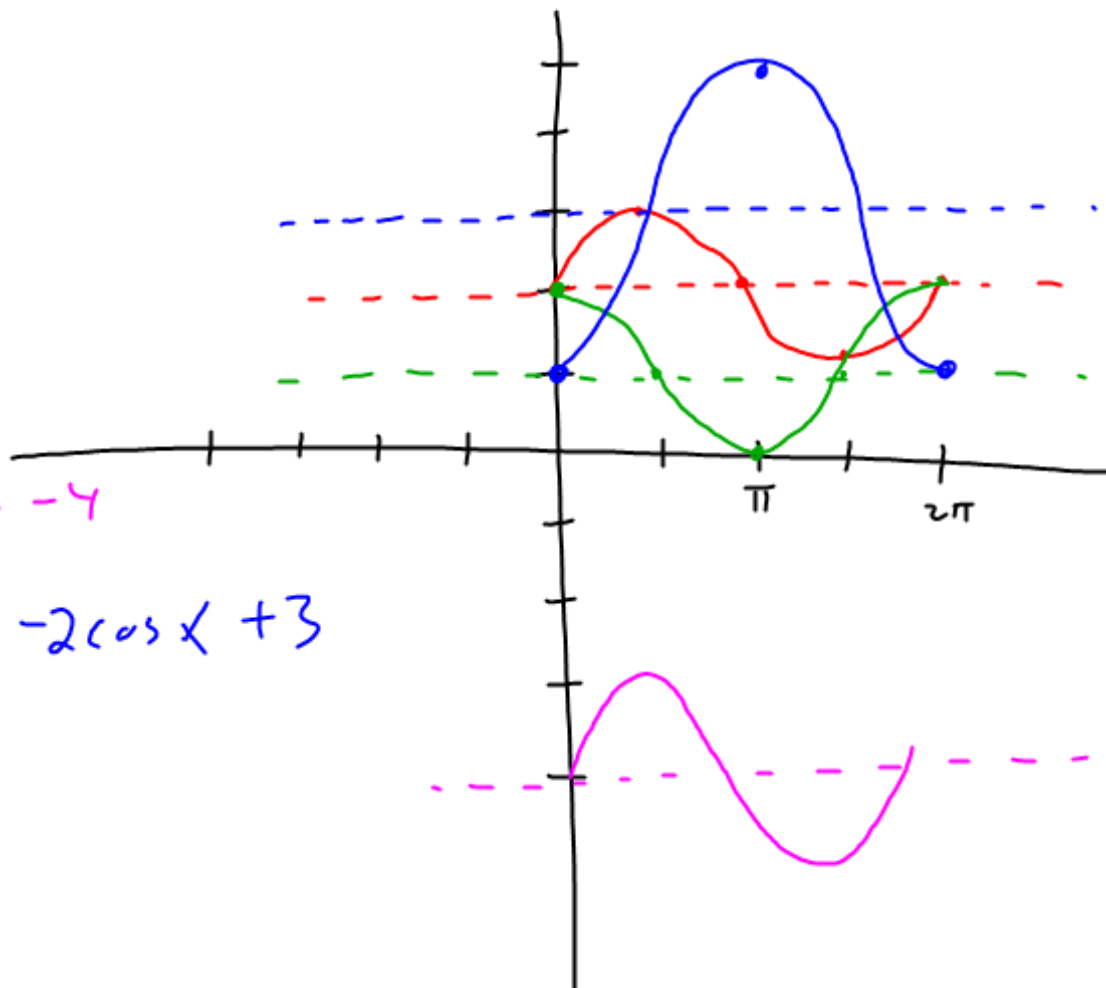
$$y = \sin(x) + 2$$

$$y = \cos(x) + 1$$

$$y = -4 + \sin x \rightarrow \sin x - 4$$

$$y = 3 - 2\cos x \rightarrow -2\cos x + 3$$

up 3  
 flip  
 stretch by 2



$$\sin\left(x - \frac{\pi}{3}\right)$$

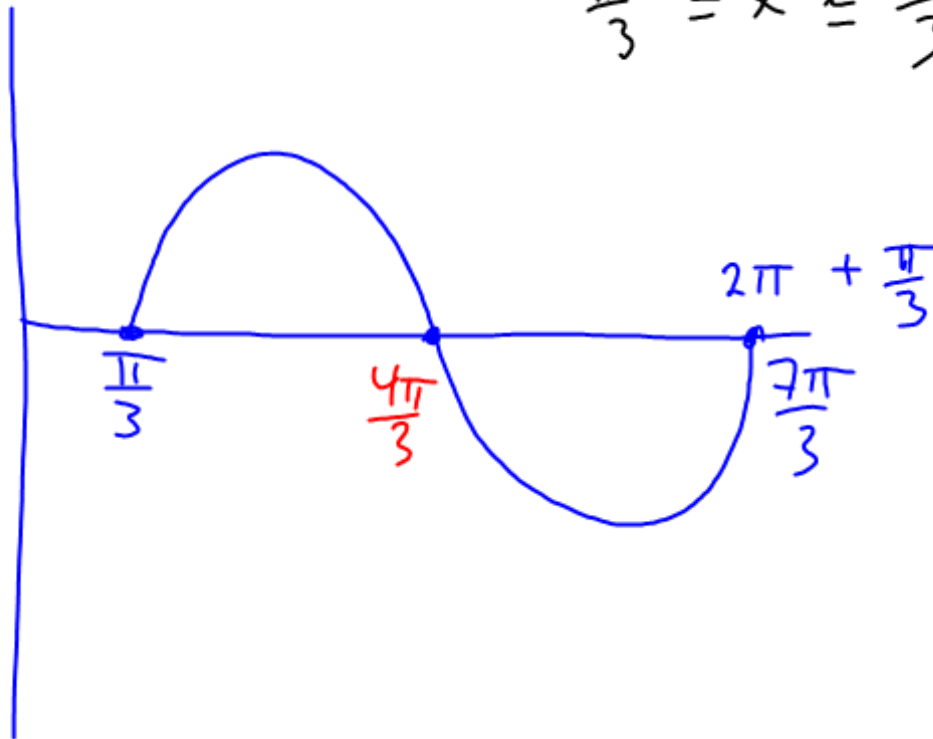
Shifts  $+\frac{\pi}{3}$

$$0 \leq \sin x \leq 2\pi$$

$$0 \leq x - \frac{\pi}{3} \leq 2\pi$$

$$+\frac{\pi}{3} \quad +\frac{\pi}{3} \quad +\frac{\pi}{3}$$

$$\frac{\pi}{3} \leq x \leq \frac{7\pi}{3}$$



$$\frac{\pi}{3} + \frac{7\pi}{3} = \frac{8\pi}{3} \cdot \frac{1}{2}$$

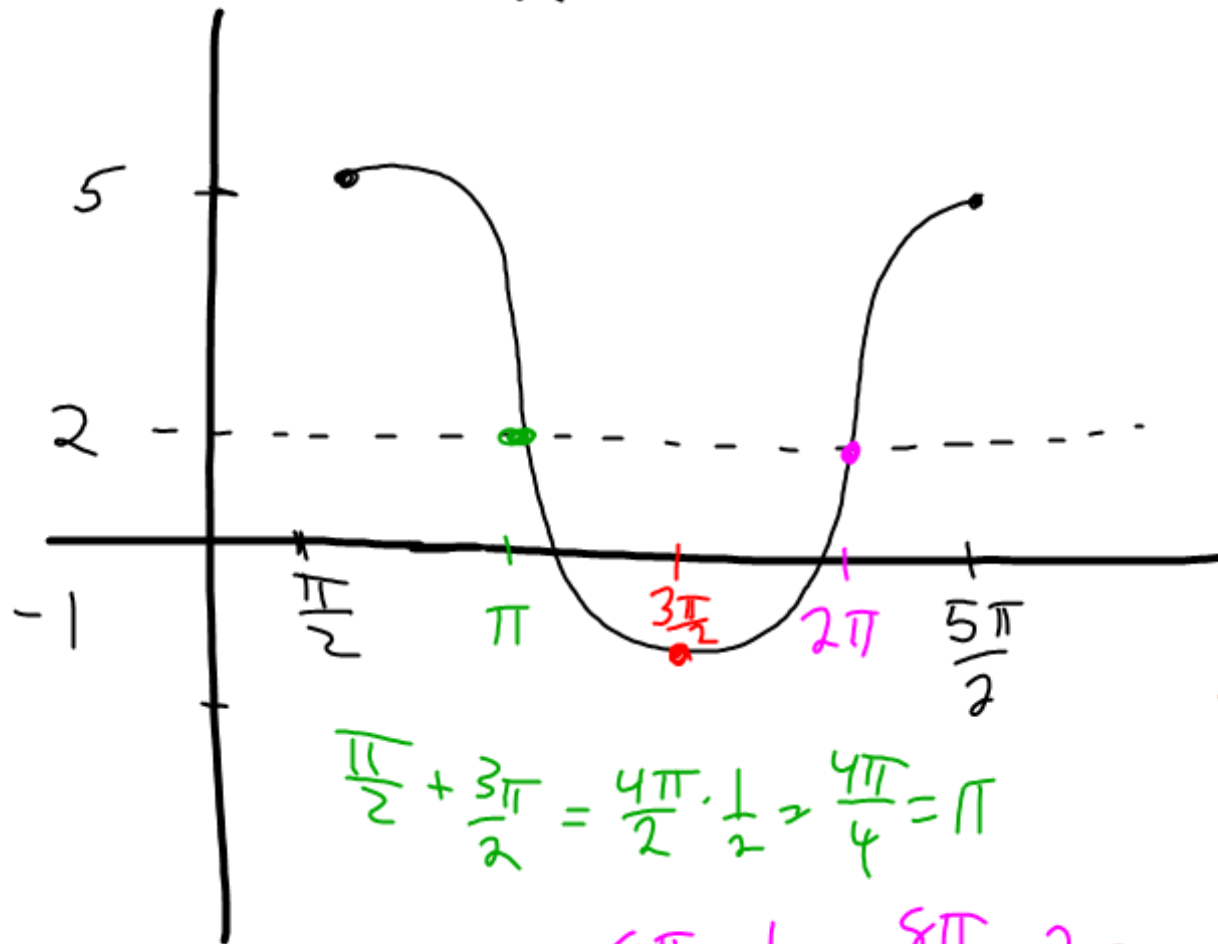
$$\frac{8\pi}{6} = \frac{4\pi}{3}$$

$$y = 2 + 3\cos\left(x - \frac{\pi}{2}\right)$$

$$1 + \frac{\pi}{2}$$

$$2\pi + \frac{\pi}{2} = \frac{5\pi}{2}$$

$$\frac{4\pi}{2} + \frac{\pi}{2}$$



$$\frac{\pi}{2} + \frac{3\pi}{2} = \frac{4\pi}{2} \cdot \frac{1}{2} = \frac{4\pi}{4} = \pi$$

$$\frac{3\pi}{2} + \frac{5\pi}{2} = \frac{8\pi}{2} \cdot \frac{1}{2} = \frac{8\pi}{4} = 2\pi$$

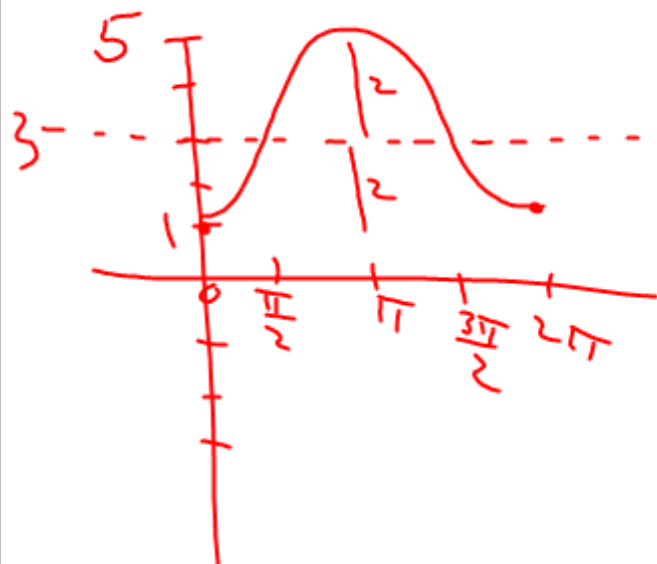
$$\frac{5\pi}{2} + \frac{\pi}{2} = \frac{6\pi}{2} = 3\pi \cdot \frac{1}{2} = \frac{3\pi}{2}$$

Graph

$$y = \sin(x) + 2$$

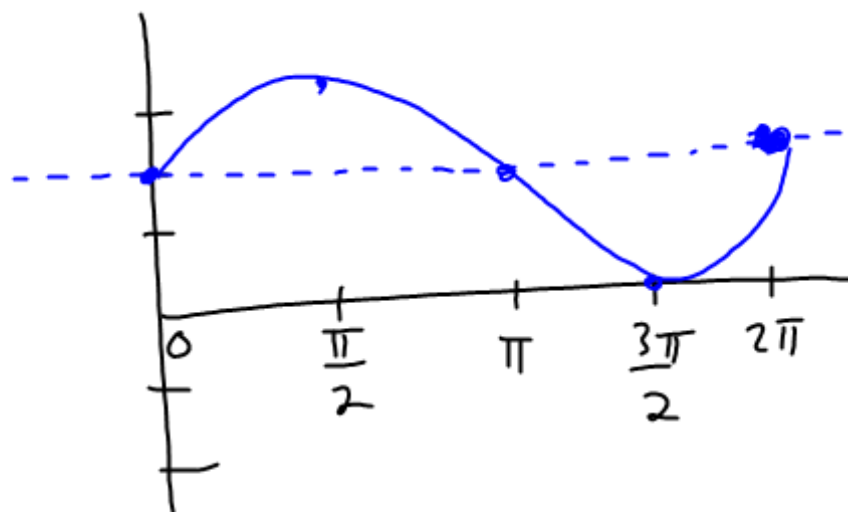
$$y = 3 - 2\cos(x)$$

$$y = -2\cos(x) + 3$$



$$\sin(0) + 2 = 2$$

$$\sin\left(\frac{\pi}{2}\right) + 2 = 3$$



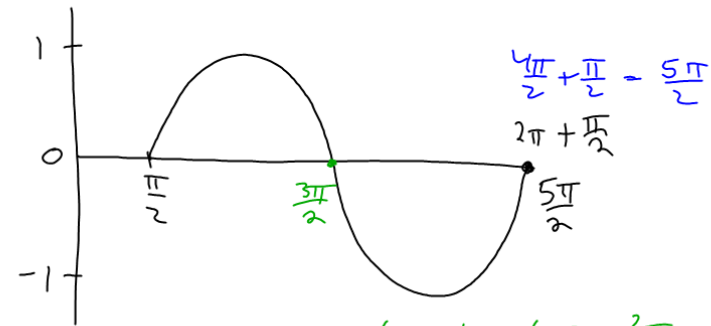
$$y = x^2 \quad \text{rt 2} \quad y = (x-2)^2$$

$$y = \sqrt{x} \quad \text{rt 2} \quad y = \sqrt{x-2}$$

$$y = |x| \quad \text{rt} \quad y = |x-2|$$

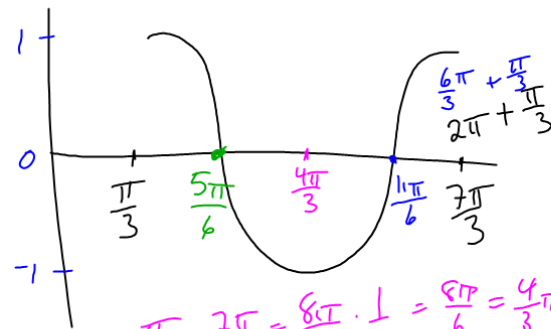
$$y = \sin(x) \quad y = \sin(x-2)$$

$$y = \sin\left(x - \frac{\pi}{2}\right)$$



$$\frac{\pi}{2} + \frac{5\pi}{2} = \frac{6\pi}{2} \cdot \frac{1}{2} = \frac{6\pi}{4} = \frac{3\pi}{2}$$

$$y = \cos\left(x - \frac{\pi}{3}\right) \quad \text{ft}$$



$$\frac{\pi}{3} + \frac{7\pi}{3} = \frac{8\pi}{3} \cdot \frac{1}{2} = \frac{8\pi}{6} = \frac{4\pi}{3}$$

$$\frac{\pi}{3} + \frac{4\pi}{3} = \frac{5\pi}{3} \cdot \frac{1}{2} = \frac{5\pi}{6}$$



4.2 #1-8, Graph #15, 16, 23-28(4), 35, 36, 43, 44